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10/725,241	12/01/2003	Xiang-Dong Mi	681954.0682	1951

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EXAMINER	
BODDIE, WILLIAM	

ART UNIT	PAPER NUMBER
2629	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/725,241	MI ET AL.	
	Examiner	Art Unit	
	William L. Boddie	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *36* is/are allowed.

6)☒ Claim(s) *1-10 and 12-35* is/are rejected.

7)☒ Claim(s) *11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. In an amendment dated, February 4th, 2008 the Applicant traversed the rejections of claims 1-10 and 12-35. Currently claims 1-36 are pending.

Response to Arguments

2. Applicant's arguments filed February 4th, 2008 have been fully considered but they are not persuasive.

3. The Applicant first argues, on page 2 of the Remarks, that Kahn does not teach or suggest applying a first voltage to the conductors. The Applicant cites a line from Kahn which states that "a pulse of optical energy, as opposed to electrical energy used in the prior art, is incident upon a liquid crystal cell."

The Examiner must respectfully disagree. While yes, Kahn performs the vast majority of the liquid crystal transition with the optical light source, this does not entirely remove the fact that figure 2, which Kahn describes as a "preferred embodiment", has a very evident voltage source connected to the two unpatterned electrodes. Thus there is indeed at the very least a first voltage applied to the unpatterned conductors.

4. On pages 2-3 of the Remarks, the Applicant argues that Kahn does not disclose "an image wise pattern of light."

The Examiner must again respectfully disagree. Kahn expressly discloses writing patterns on the liquid crystal with the light. Applicant is specifically pointed to column 6, lines 18-19 which state, "this enables faster writing of bright ***patterns*** on dark backgrounds" (emphasis added). Therefore, it seems clear that Kahn discloses image wise patterns of light.

The Applicant also argues that Okafuji does not cure the above alleged deficiencies. This argument is moot in view of the above rebuttal. It is clear to the Examiner that Kahn does disclose among other things, image wise pattern of light and applying a first voltage to the conductors. It is important to note that the Examiner never claimed that Okafuji disclosed these limitations and was not the nature of the combination of Kahn with Okafuji.

5. The subsequent arguments, on pages 3-7 of the Remarks, are identical to those stated above. As such these arguments are not seen as persuasive either. As shown above the rejections presented in the previous office action are seen as sufficient and are thus maintained.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1, 7-10, 12 and 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kahn et al. (US 5,080,467) in view of Okafuji et al. (US 7,138,973).

With respect to claim 1, Kahn discloses, a method of writing an image on a liquid crystal display of the type having a layer of cholesteric liquid crystal material (col. 7, lines 2-10) disposed between a pair of unpatterned conductors (34 and 36 in fig. 2) and a light absorbing layer (35 and 37 in fig. 2; col. 6, lines 39-44) for forming an image

wise thermal pattern (col. 5, lines 33-38) in response to an image wise pattern of light (42 in fig. 2; col. 5, lines 29-32), comprising:

a) applying a first RMS voltage to the conductors (note the voltage waveform applied to 34 and 36 in fig. 2); and

c) exposing the liquid crystal display to the image wise pattern of light (clear from fig. 2).

Kahn does not expressly disclose, applying a second RMS voltage to the conductors.

Okafuji discloses, a method of writing an image on a liquid crystal display of the type having a layer of cholesteric liquid crystal material (see title), comprising:

a) applying a first RMS (fig. 6) voltage (V1 in first non-active region in fig. 6) to conductors (24 and 26 in fig. 3)

b) applying a second RMS voltage (V6 in second non-active region in fig. 6) different from the first RMS voltage (clear from fig. 6) to the conductors after applying the first RMS voltage (clear from fig. 6), wherein the first and second RMS voltages are non-zero (clear from fig. 6).

Kahn and Okafuji are analogous art because they are both from the same field of endeavor namely cholesteric liquid crystal display devices and addressing methods.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the driving voltage waveform of Kahn with the voltages of Okafuji.

The motivation for doing so would have been to decrease the effect of impurities dissolved in the liquid crystal material and expand the life time of the liquid crystal material (Okafuji; col. 2, lines 64-67).

With respect to claim 7, Okafuji and Kahn disclose, the method claimed in claim 1 (see above).

Okafuji further discloses, the step of applying a third voltage (V0 in selection period in fig. 6) between the first (V1 in first non-active period in fig. 6) and second voltages (V6 in second no-active region in fig. 6).

With respect to claim 8, Kahn and Okafuji disclose, the method claimed in claim 7 (see above).

Okafuji further discloses, wherein the step of exposing occurs during the application of the third voltage (V0 in selection period in fig. 6; it is in the third voltage that the cell is selected to be either on/off; as such this is seen as equivalent to exposing upon combination with Kahn), and wherein the third voltage is less than the first and second voltages (clear from fig. 6).

With respect to claim 9, Kahn and Okafuji disclose, the method claimed in claim 8 (see above).

Okafuji further discloses, wherein the second voltage is greater than the first and third voltages (clear from fig. 6, that V6 >V1 >V0).

With respect to claim 10, Okafuji and Kahn disclose, the method claimed in claim 7 (see above).

Okafuji further discloses, wherein the third voltage is zero (clear from fig. 6).

With respect to claim 12, Kahn and Okafuji disclose, the method claimed in claim 7 (see above).

Okafuji further discloses, the step of applying a fourth voltage (V5 in selection period in fig. 6) between the first (V1 in first non-active period in fig. 6) and the third voltages (V0 in selection period in fig. 6).

With respect to claim 14, Kahn and Okafuji expressly disclose, the method claimed in claim 12 (see above).

Okafuji further discloses, the step of applying a fifth voltage (V0 in preparation period in fig. 6) between the first (V1 in first non-active period in fig. 6) and fourth voltages (V5 in selection period in fig. 6).

With respect to claim 15, Kahn and Okafuji disclose, the method claimed in claim 14 (see above).

Okafuji further discloses, wherein the step of exposing occurs during the application of the third voltage (V0 in selection period in fig. 6; it is in the third voltage that the cell is selected to be either on/off; as such this is seen as equivalent to exposing upon combination with Kahn), and wherein the second voltage is greater than the third, fourth and fifth voltage (clear from fig. 6, that V6>V5>V0).

8. Claims 1, 5-8, 12-13, 16, 26 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kahn et al. (US 5,080,467) in view of Yang et al. (US 6,154,190).

With respect to claim 1, Kahn discloses, a method of writing an image on a liquid crystal display of the type having a layer of cholesteric liquid crystal material (col.

7, lines 2-10) disposed between a pair of unpatterned conductors (34 and 36 in fig. 2) and a light absorbing layer (35 and 37 in fig. 2; col. 6, lines 39-44) for forming an image wise thermal pattern (col. 5, lines 33-38) in response to an image wise pattern of light (42 in fig. 2; col. 5, lines 29-32), comprising:

a) applying a first RMS voltage to the conductors (note the voltage waveform applied to 34 and 36 in fig. 2); and

c) exposing the liquid crystal display to the image wise pattern of light (clear from fig. 2).

Kahn does not expressly disclose, applying a second RMS voltage to the conductors.

Yang discloses, a method of writing an image on a liquid crystal display of the type having a layer of cholesteric liquid crystal material, comprising:

a) applying a first RMS (fig. 15) voltage (Vp in fig. 21a) to conductors (162 and 182 in fig. 2b)

b) applying a second RMS voltage (Vs in fig. 21a) different from the first RMS voltage (clear from fig. 21a) to the conductors after applying the first RMS voltage (clear from fig. 21a), wherein the first and second RMS voltages are non-zero (clear from fig. 21a).

Kahn and Yang are analogous art because they are both from the same field of endeavor namely cholesteric liquid crystal display devices and addressing methods.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the driving voltage waveform of Kahn with the voltages of Yang.

The motivation for doing so would have been to increase the speed of writing to the display (Yang; col. 18, lines 31-35).

With respect to claim 5, Kahn and Yang disclose, the method claimed in claim 1 (see above).

Yang further discloses, wherein the second voltage is higher than the first voltage (clear from fig. 21a).

With respect to claim 6, Kahn and Yang disclose, the method claimed in claim 1 (see above).

Yang further discloses, wherein the first voltage is effective to drive the cholesteric liquid crystal material to a focal conic state (clear from fig. 21a).

With respect to claim 7, Yang and Kahn disclose, the method claimed in claim 1 (see above).

Yang further discloses, the step of applying a third voltage (Vs in fig. 11a/b) between the first (Vp in fig. 11a/b) and second voltages (Ve in fig. 11a/b).

With respect to claim 12, Kahn and Yang disclose, the method claimed in claim 7 (see above).

Yang further discloses, the step of applying a fourth voltage (Vi in fig. 11a/b) between the first (Vp in fig. 11a/b) and the third voltages (Vs in fig. 11a/b).

With respect to claims 8 and 13, Kahn and Yang disclose, the method claimed in claims 7 and 11 (see above).

Yang further discloses, wherein the step of exposing occurs during the application of the third voltage (Vs in fig. 11a/b; it is in the third voltage that the cell is

selected to be either on/off; as such this is seen as equivalent to exposing upon combination with Kahn), and wherein the third voltage is less than the first voltage, and the second voltage is greater than the third and fourth voltages (clear from fig. 11a/b).

With respect to claim 16, Kahn and Yang disclose, the method claimed in claim 5 (see above).

Yang further discloses, wherein the duration of the second voltage is less than 2 milliseconds (col. 18, lines 63-65).

With respect to claim 26, Kahn discloses, an apparatus for writing an image on a liquid crystal display having a layer of cholesteric liquid crystal material (col. 7, lines 2-10) disposed between a pair of unpatterned conductors (34 and 36 in fig. 2) and a light absorbing layer (35 and 37 in fig. 2; col. 6, lines 39-44) for forming an image wise thermal pattern (col. 5, lines 33-38) in response to an image wise pattern of light (42 in fig. 2; col. 5, lines 29-32), comprising:

a) means for applying a first RMS voltage to the conductors (note the voltage waveform applied to 34 and 36 in fig. 2); and

c) means for exposing the liquid crystal display to the image wise pattern of light (clear from fig. 2).

Kahn does not expressly discloses, means for applying a second RMS voltage to the conductors.

Yang discloses, an apparatus for writing an image on a liquid crystal display of the type having a layer of cholesteric liquid crystal material, comprising:

a) means for applying a first RMS (fig. 15) voltage (Vp in fig. 21a) to conductors (162 and 182 in fig. 2b)

b) means for applying a second RMS voltage (Vs in fig. 21a) different from the first RMS voltage (clear from fig. 21a) to the conductors after applying the first RMS voltage (clear from fig. 21a), wherein the first and second RMS voltages are non-zero (clear from fig. 21a).

Kahn and Yang are analogous art because they are both from the same field of endeavor namely cholesteric liquid crystal display devices and addressing methods.

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the driving voltage waveform of Kahn with the voltages of Yang.

The motivation for doing so would have been to increase the speed of writing to the display (Yang; col. 18, lines 31-35).

With respect to claims 28-29, these claims are seen as apparatus versions of the previously rejected method claims 5-6, respectively. As such claims 28-29 are rejected based on the same merits discussed above in the rejections of claims 5-6.

9. Claims 2-4, 17-19 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kahn et al. (US 5,080,467) in view of Yang et al. (US 6,154,190) and further in view of Kobayashi (US 2002/0005827).

With respect to claims 2-4, Kahn and Yang disclose, the method claimed in claim 1 (see above).

Neither Kahn nor Yang expressly disclose, when the step of exposing occurs in relationship to the first non-zero voltage.

Kobayashi discloses, a method of writing an image on a liquid crystal display (fig. 8) of the type having a layer of cholesteric liquid crystal material (37 in fig. 8) disposed between a pair of unpatterned conductors (42 and 38 in fig. 8); and

wherein the liquid crystal display is exposed prior, during and after a first non-zero voltage (paras. 76-87; specifically note the different time constants).

Kahn, Yang and Kobayashi are all analogous art because they are both from the same field of endeavor namely cholesteric liquid crystal display devices and driving methods.

At the time of the invention it would have been obvious to one of ordinary skill in the art to expose the lcd panel of Kahn and Yang at the times disclosed by Kobayashi.

The motivation for doing so would have been to achieve a highly sensitive recording apparatus having a wide margin (Kobayashi; end of para. 78).

With respect to claims 17-19, Kahn and Yang disclose, the method claimed in claim 1 (see above).

Kahn further discloses, wherein the step of exposing the display to an image wise pattern of light is performed with a flash lamp (42, 44 in fig. 2).

Neither Kahn nor Yang expressly disclose, that a mask is also used in the exposing step.

Kobayashi discloses, a method of writing an image on a liquid crystal display (fig. 8) of the type having a layer of cholesteric liquid crystal material (37 in fig. 8) disposed between a pair of unpatterned conductors (42 and 38 in fig. 8); and

wherein a step of exposing the display to an image wise pattern of light is performed with a liquid crystal device (24 in fig. 8) that serves as an electronically programmable mask (para. 193).

At the time of the invention it would have been obvious to one of ordinary skill in the art to include the lcd mask of Kobayashi in the device of Yang and Kahn.

The motivation for doing so would have been to significantly improve the sensitivity of the device (Kobayashi; end of para. 198).

With respect to claim 27, claim 27 is seen as merely an apparatus version of the previously rejected method claims 2. As such claim 27 is rejected based on the same merits discussed above in the rejection of claims 2.

10. Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kahn et al. (US 5,080,467) in view of Yang et al. (US 6,154,190) and further in view of Konuma et al. (US 5,357,356).

With respect to claims 20-21, Kahn and Yang disclose, the method claimed in claim 1 (see above).

Neither Kahn nor Yang expressly disclose, wherein the cholesteric liquid crystal layer is a polymer-dispersed layer; wherein the polymer is gelatin.

Konuma discloses, , a method of writing an image on a liquid crystal display (fig. 1) of the type having a layer of cholesteric liquid crystal material (102 in fig. 1) disposed between a pair of unpatterned conductors (101-101' in fig. 1); and

wherein the cholesteric liquid crystal layer is a polymer (gelatin) dispersed layer (col. 1, lines 7-8, 42-44).

At the time of the invention it would have been obvious to one of ordinary skill in the art to replace the cholesteric layer of Kahn and Yang with the polymer dispersed layer of Konuma.

The motivation for doing so would have been to obtain a very bright display (Konuma; col. 1, lines 65-66).

11. Claims 22-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kahn et al. (US 5,080,467) in view of Yang et al. (US 6,154,190) and further in view of Mi et al. (US 2003/0206147).

With respect to claims 22-25, Kahn and Yang disclose, the methods claimed in claims 1, 7, 12 and 14 (see above).

Yang further discloses, wherein the voltages are generated by bipolar waveforms (fig. 15; for example).

Neither Kahn nor Yang expressly disclose, wherein the voltages are generated by bipolar waveforms that have the same amplitudes and different duty cycles.

Mi discloses, a cholesteric liquid crystal display (fig. 1), wherein the applied driving voltages are generated by bipolar waveforms that have the same amplitudes and different duty cycles (abstract; also see para. 10, for example).

Mi, Kahn and Yang are all analogous art because they are all from the same field of endeavor namely, cholesteric liquid crystal display devices and driving methods

At the time of the invention it would have been obvious to one of ordinary skill in the art to generate the voltages of Yang and Kahn as taught by Mi.

The motivation for doing so would have been to optimize contrast, brightness, and gray levels on cholesteric liquid crystal displays (Mi; abstract).

Allowable Subject Matter

12. Claim 36 is allowed.

13. Claim 11 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to William L. Boddie whose telephone number is (571) 272-0666. The examiner can normally be reached on Monday through Friday, 7:30 - 4:30 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sumati Lefkowitz can be reached on (571) 272-3638. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Wlb
2/14/08

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